

WHAT IS CLAIMED IS:

1 1. A photographing apparatus having a function of preventing a blur of a still image, the
2 apparatus comprising:

3 a photoelectric transduction unit for photoelectrical-transducing incident light from a lens;

4 a pulse generation unit for outputting a charge extract pulse for extracting charge
5 accumulated in the photoelectric transduction unit, and an erase pulse for erasing the accumulated
6 charge;

7 a diaphragm unit for controlling an amount of light incident on the photoelectric transduction
8 unit;

9 a diaphragm driving unit for controlling an open/close operation of the diaphragm unit; and

10 a control unit for outputting, to the diaphragm driving unit, a first control signal to supply
11 a driving voltage in a direction of opening the diaphragm unit, for outputting, to the diaphragm unit,
12 a second control signal to supply the driving voltage in a direction of closing the diaphragm unit, and
13 for controlling the operation of the photoelectric transduction unit, the pulse generation unit, and the
14 diaphragm driving unit.

1 2. The apparatus according to claim 1, wherein the diaphragm driving unit comprises:

2 a diaphragm motor for opening and closing the diaphragm unit by imparting a rotational
3 movement generated by a magnetic field to the diaphragm unit; and

4 a diaphragm motor driving unit for controlling a direction of rotation and a speed of the
5 diaphragm motor.

1 3. The apparatus according to claim 2, wherein the diaphragm motor comprises:

2 a rotor connected to the diaphragm unit, and rotated in at least one of a forward direction and
3 a backward direction under control of the diaphragm motor driving unit;

4 an elastic member having one end connected to a fixed point and another end connected to
5 the rotor for rotating the rotor in a direction for closing the diaphragm unit;

6 a driving coil for generating a magnetic field to cause a rotational movement of the rotor in
7 at least one of a direction for opening and a direction for closing the diaphragm unit; and

8 damping means, including a damping coil, a switch connected to said damping coil, and a
9 damping resistance connected to said switch, for preventing damping of the rotor.

1 4. The apparatus according to claim 3, wherein the diaphragm motor driving unit comprises:

2 an input voltage terminal unit having one end for receiving a reference potential signal and
3 another end for receiving a diaphragm control signal; and

4 a voltage conversion unit for converting an input voltage from the input voltage terminal unit
5 into a driving voltage of the diaphragm motor;

6 wherein the control unit outputs the first control signal for varying the diaphragm control
7 signal to form the driving voltage in the driving coil in a direction for closing the diaphragm unit,

8 and outputs the second control signal for opening the switch of the damping means when closing the
9 diaphragm unit.

1 5. The apparatus according to claim 4, wherein the varied diaphragm control signal is
2 supplied until the operation of extracting the charge accumulated in the photoelectric transduction
3 unit is completed according to the charge extract pulse from the pulse generation unit.

1 6. The apparatus according to claim 4, wherein the varied diaphragm control signal causes
2 an initial value of the driving voltage to be higher than a final value of the driving voltage for a
3 predetermined period of time after a start time of the close operation of the diaphragm unit.

1 7. The apparatus according to claim 3, wherein the diaphragm motor driving unit comprises:
2 an input voltage terminal unit having one end for receiving a reference potential signal and
3 another end for receiving a diaphragm control signal;

4 a voltage conversion unit for converting an input voltage from the input voltage terminal unit
5 into a driving voltage of the diaphragm motor; and

6 a switch unit for varying a voltage supplied from the voltage conversion unit to the
7 diaphragm motor according to a short operation, and for supplying the driving voltage to the
8 diaphragm motor to alternately open and close the diaphragm unit;

9 wherein the control unit outputs a switching control signal to the switch unit, thereby

10 outputting a control signal for supplying, to the diaphragm unit, the driving voltage for closing the
11 diaphragm unit by inverting the driving voltage supplied to the diaphragm motor in opening the
12 diaphragm unit when closing the diaphragm unit, and for outputting a control signal for opening the
13 switch connected to the damping coil when supplying the driving voltage to close the diaphragm
14 unit.

1 8. The apparatus according to claim 7, wherein the driving voltage for closing the diaphragm
2 unit is supplied until the operation of extracting the charge accumulated in the photoelectric
3 transduction unit is completed according to the charge extract pulse from the pulse generation unit.

1 9. The apparatus according to claim 8, wherein the driving voltage has an initial value higher
2 than a final value, and is a step signal which maintains the initial value for a predetermined period
3 of time.

1 10. The apparatus according to claim 1, further comprising a photographing mode switching
2 unit for switching between a still image mode and a motion picture mode, wherein the control unit
3 outputs a control signal for supplying the driving voltage for closing the diaphragm unit when the
4 photographing mode switching unit is switched to the still image mode.

1 11. The apparatus according to claim 1, further comprising:

an electronic shutter unit for controlling an amount of the charge accumulated in the photoelectric transduction unit by varying a potential barrier value of the photoelectric transduction unit;

a lookup table unit for recording compensation values of an electronic shutter speed corresponding to variations of the close time of the diaphragm unit on the basis of the electronic shutter speed set up for a reference close time from an open state to a close state of the diaphragm unit; and

a measuring unit for measuring the close time of the diaphragm unit, wherein the control unit outputs to the electronic shutter unit a control signal for varying the electronic shutter speed by as much as the compensation value recorded in the lookup table unit according to a difference between the close time measured in the measuring unit and the reference close time.

12. The apparatus according to claim 11, wherein the diaphragm driving unit comprises:

a diaphragm motor for opening and closing the diaphragm unit by imparting a rotational movement generated by a magnetic field to the diaphragm unit; and

a diaphragm motor driving unit for controlling a direction of rotation and a speed of the diaphragm motor.

13. The apparatus according to claim 12, wherein the diaphragm motor comprises:

a rotor connected to the diaphragm unit, and rotated in at least one of a forward direction and

3 a backward direction under control of the diaphragm motor driving unit;
4 an elastic member having one end connected to a fixed point and another end connected to
5 the rotor for rotating the rotor in a direction for closing the diaphragm unit;
6 a driving coil for generating a magnetic field to cause a rotational movement of the rotor in
7 at least one of a direction for opening and a direction for closing the diaphragm unit; and
8 damping means, including a damping coil, a switch connected to said damping coil, and a
9 damping resistance connected to said switch, for preventing damping of the rotor.

1 14. The apparatus according to claim 12, wherein the diaphragm motor driving unit
2 comprises:

3 an input voltage terminal unit having one end for receiving a reference potential signal and
4 another end for receiving a diaphragm control signal; and

5 a voltage conversion unit for converting an input voltage from the input voltage terminal unit
6 into a driving voltage of the diaphragm motor;

7 wherein the control unit outputs the first control signal for varying the diaphragm control
8 signal to form the driving voltage in the driving coil in a direction for closing the diaphragm unit,
9 and outputs the second control signal for opening the switch of the damping means when closing the
10 diaphragm unit.

1 15. The apparatus according to claim 14, wherein the varied diaphragm control signal is

supplied until the operation of extracting the charge accumulated in the photoelectric transduction unit is completed according to the charge extract pulse from the pulse generation unit.

16. The apparatus according to claim 14, wherein the varied diaphragm control signal causes an initial value of the driving voltage to be higher than a final value of the driving voltage for a predetermined period of time after a start time of the close operation of the diaphragm unit.

17. The apparatus according to claim 14, wherein the diaphragm motor driving unit comprises:

an input voltage terminal unit having one end for receiving a reference potential signal and another end for receiving a diaphragm control signal;

a voltage conversion unit for converting the input voltage from the input voltage terminal unit into a driving voltage of the diaphragm unit; and

a switch unit for varying a voltage supplied from the voltage conversion unit to the diaphragm motor according to a short operation, and for supplying the driving voltage to the diaphragm motor to alternately open and close the diaphragm unit;

wherein the control unit outputs a switching control signal to the switch unit, thereby outputting a control signal for supplying to the diaphragm unit the driving voltage for closing the diaphragm unit by inverting the driving voltage supplied to the diaphragm motor in opening the diaphragm unit, and for outputting a control signal for opening the switch connected to the damping

14 coil when supplying the driving voltage to close the diaphragm unit.

1 18. The apparatus according to claim 17, wherein the driving voltage for closing the
2 diaphragm unit is supplied until the operation of extracting the charge accumulated in the
3 photoelectric transduction unit is completed according to the charge extract pulse from the pulse
4 generation unit.

1 19. The apparatus according to claim 18, wherein the driving voltage has an initial value
2 higher than a final value, and is a step signal which maintains the initial value for a predetermined
3 period of time.

1 20. The apparatus according to claim 11, further comprising a photographing mode
2 switching unit for switching between a still image mode and a motion picture mode, and wherein,
3 when the photographing mode switching unit is set up in the still image mode, the control unit
4 outputs a control signal for supplying the driving voltage for closing the diaphragm unit.